

The American Midland Naturalist

Devoted to Natural History, Primarily
that of the Prairie States

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The American Midland Naturalist

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MARCH, 1930

No. 2.

LIST OF FLOWERING PLANTS AND FERNS IN THE DUNES STATE PARK AND VICINITY, PORTER COUNTY, INDIANA, SUPPLEMENT ¹

MARCUS WARD LYON, JR.
SOUTH BEND, INDIANA

In the three years since the original list² of flowering plants and ferns in the dunes region of Porter County was published as many visits to the region have been made as time and other circumstances permitted. On these excursions about 50 additional species or named forms of plants have been collected as well as considerable material showing extensions of range of species in the one or two mile strip of Porter County bordering Lake Michigan. Two grasses of the original list have been referred to other species by Mr. Chas. C. Deam. Another grass has been re-identified by him as the same as one of the species already recorded. The specimens listed originally as *Artemesia canadensis* have been carefully examined by Mr. D. C. Peattie and found improperly named. A critical examination of many of my determinations will probably reveal similar errors. There is a net increase of 45 species for the years 1927, 1928, 1929. One of these species, *Satureja hortensis*, is in the Nieuwland Herbarium and was overlooked when the original list was published. These added

¹ Read at the Forty-fifth Annual Meeting of the Indiana Academy of Science, Richmond, Indiana, December 6, 1929.

² Amer. Midland Naturalist 10 pp. 245 to 295, 1927.

to the original 780 forms bring the total number of plants from the northern strip of Porter County to 825.

Since the original list appeared two important books dealing with the region in part have appeared: *An Annotated Flora of the Chicago Area*, by H. S. Pepon, 1927, and *Grasses of Indiana*, by Chas. C. Deam, 1929. Deam's work appeared too late in the year, October, to serve as a guide as to additional grasses to be looked for, even if they could have been found by one not specially familiar with grasses. Only a few of the more conspicuous plants that should be found in the region according to Pepon's list have been found by me, such as *Clintonia*, *Hydrocotyle*, *Thalesia fasciculata*, *Dasystephana puberula*, *Aster sericeus*, *Solidago ohioensis*. Pepon's work covering all the ferns and flowering plants in the dunes region west of Dune Creek, with its wealth of beautiful illustrations, maps, and general discussions is unsurpassed for those botanically interested in the dunes of the lower end of Lake Michigan.

Many of the trips into the dunes area during the past three years were made to the westward of where most of the previous collecting was done, as far as Wickliffe, or the so-called Ogden Dunes, and the eastern end of Long Lake. The general characteristics of the country do not appear to be essentially different between the eastern and the western ends of the Porter County dunes of Lake Michigan, but there appear to be some striking differences in the plants found in each. West of Mineral Springs are found such striking plants as *Clintonia*, *Liparis loeselii*, *Hypoxis*, *Hydrocotyle*, *Eryngium*, *Hudsonia*, *Phlox bifida*, *Linnaea*, *Sabbatia*, *Dasystephana puberula*, *Aster sericeus*. East of Mineral Springs only a few conspicuous plants are found which do not occur westward, *Blepharoglottis psychodes*, *Viola primulifolia*, *Platanus occidentalis*. These differences may be more apparent than real as it is impossible to see every plant in the area, but it is probably unlikely that such conspicuous plants as *Phlox bifida* and *Aster sericeus* would escape notice.

There seems to be an apparent yearly occurrence of certain

plants, though what part "directive attention" plays in the matter is difficult to say. In the original list *Hypoxis* was regarded as rare, and the record was based on a single specimen. The next year it appeared to be abundant in what was apparently the same meadow whence came the original single plant. Also *Gymnadeniopsis clavellata* was regarded as rare but in 1929, next to *Ibidium cernuum* it seemed to be the commonest orchid.

In view of the rapid development of the dunes by real estate companies some remarks in regard to localities are pertinent. As in the original list so in this short one the localities are referred to by the names indicated on *Map of the Indiana Dunes* by P. S. Goodman, member of the Prairie Club, published by Rand McNally and Company, 1920. It is unfortunate that the names employed by Goodman are not universally used. Thus Furnessville Blowout is frequently spoken of as Drury's Blowout, and Big Blowout as Furnessville Blowout. Walker Lake is often referred to as Goose Lake (Pepoon, Annotated Flora Chicago Area, p. 102), and Dune Creek is otherwise termed Fort or Coffee Creek (Pepoon, p. 127).

The southeast corner of the State Park approximately coincides with the South Shore Line Station, known as Keiser. The whole region east of the park now known as Bartlett's Addition is being rapidly developed, swamps drained, roads put through and houses built. The region west of the west boundary of the Park and north of Mineral Springs Station is known as Dunes Acres. It includes Cowles' tamarack swamp and the golf course in the bed of what was once Little Lake. Dunes Acres is rather exclusive and the general public is kept out. This protects the vegetation from vandalism. In 1929 the Fringed Gentian was common here, while a few years before it was represented by only a few plants. The country north of Baileytown and about Walker Lake is still in almost unchanged and primitive condition, probably due to its inaccessibility by motor car. The dunes at Wickliffe are now called Ogden Dunes. Many cottages are

built there, but the most conspicuous object is the high artificial chute used for ski jumping in winter.

With respect to the State Park and to each other the various stations of the South Shore Line referred to in the original list and in this supplement are: Tamarack, about two miles east of the southeast corner of the Park; Keiser, approximately coinciding with the same corner; Furnessville (so-called station apparently abandoned) a little east of the middle of the south boundary of the Park; Tremont, the main entrance to the park; Port Chester, a little south of the southwest corner of the Park; Mineral Springs, approximately one mile west of Port Chester; Oak Hill, a mile west of Mineral Springs; Baileytown, a half mile farther west; Dune Park, of the New York Central, the same as Wilson of the South Shore Line, is about two miles west of Baileytown; Wickliffe, near the east end of Long Lake, is about one and one-half miles west of Dune Park.

As on previous occasions, my wife, Dr. Martha Brewer Lyon, has been with me on nearly all the trips of the past three years and assisted in collecting. Especially during 1929 we were fortunate in having the company of Rev. J. A. Nieuwland on many trips. Mr. Chas. C. Deam and Mrs. Deam were with us on one occasion when we visited the *Clintonia* colony for a second time. I take pleasure in expressing my appreciation of the assistance these persons rendered in collecting and identifying specimens, especially Mr. Deam, who has examined and named all the grasses in my herbarium and many of the sedges. Dr. Nieuwland collected a second set of the added species and these are in his herbarium at the University of Notre Dame.

SPECIES TO BE ADDED TO THE ORIGINAL LIST.

Botrychium simplex E. Hitchcock, Little Grape-fern. Dune Park, at edge of interdunal woods and meadow. Rare.

Panicum Addisonii Nash, Addison's Panic Grass. Tremont, wooded dune.

This species replaces *P. mattamuskeetense* of the previous list. See Deam, Grasses of Indiana, pp. 286 and 334, 1929.

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- Panicum depauperatum psilophyllum* Fernald, Smooth-leaved Panic Grass. Tremont, open wooded dune. The specimens recorded in the original list as *P. depauperatum* Muhl. have been determined by Deam as this variety, Grasses of Indiana, p. 256, 1929.
- Oryzopsis asperifolia* Michaux, White-grained Mountain-rice. Tremont, rich wooded dune. Rare. Deam, Grasses of Indiana, pp. 183, 346, 1929.
- Panicum huachucae* Ashe, Hairy Panic Grass. Tremont, subdunal woods. Deam, Grasses of Indiana, p. 278, 1929.
- Panicum villosissimum* Nash, White-haired Panic Grass. Tremont, high dry wooded dune. Deam, Grasses of Indiana, p. 281, 1929.
- Zizania aquatica angustifolia* Hitchcock, Narrow-leaved Wild Rice. Wickliffe, east end of Long Lake. Rare. Although there are apparently numerous suitable localities for supporting Wild Rice in the region, yet I have found it but this once. Undoubtedly the right spot has not been visited. No specimens of or published records for Wild Rice are listed by Deam, for Porter County, Grasses of Indiana, pp. 222-223, 1929.
- Glyceria pallida* (Torrey). Pale Manna-Grass. Tremont, edge of Dune Creek, in open woods. A single specimen labelled by Deam "Immature *Glyceria pallida*." It is not included in his list of specimens. p. 58 Grasses of Indiana, 1929.
- Poa debilis* Torrey, Weak Blue Grass. Tremont, subdunal woods. Deam, Grasses of Indiana, p. 67, 1929.
- Festuca ovina* Linnaeus, Sheep Fescue-Grass. Baileytown, open wooded dune. Identified in the field by Mr. Deam, May 29, 1929, and collected at his suggestion. Material taken by him at same time is recorded in Grasses of Indiana, p. 345.
- Hordeum jubatum* Linnaeus, Wild Barley. Along railroad tracks at Wickliffe.
- Cyperus filiculmis macilentus* Fernald, Slender Cyperus. Mineral Springs, interdunal meadow.
- Cyperus rivularis* Kunth, Shining Cyperus. Dune Park., moist open interdunal sand.
- Cyperus inflexus* Muhlenberg, Awned Cyperus. Dune Park, moist open interdunal sand.
- Eleocharis capitata* (Linnaeus), Capitate Spike-rush. Tamarack, ditch by railroad.
- Stenophyllus capillaris* (Linnaeus), Capillary Stenophyll. Baileytown, dry open sand, interdunal.
- Scirpus lineatus* Michaux, Reddish Bulrush. Wickliffe, ditch by railroad.
- Hemicarpha micrantha* (Vahl), Small flowered Hemicarph. Dune Park, moist open sand, interdunal.

- Scleria triglomerata* Michaux, Tall Nut-rush. Mineral Springs, interdunal meadow.
- Carex Hassei* Bailey, Hasse's Sedge. Dune Park, inland interdunal meadow. Identified by Chas. C. Deam.
- Carex tonsa* (Fernald), Smooth-fruited Sedge. Baileytown, open wooded dune. Identified by Chas. C. Deam.
- Juncus balticus littoralis* Engelmann, Baltic Rush. Baileytown, subdunal pond.
- Juncus bufonius* Linnaeus, Toad Rush. Baileytown, wet subdunal roadside, and moist open interdunal sandflat.
- Juncoides campestris multiflorus* Ehrhart, Many flowered Wood-rush. Dune Park, moist open interdunal sand.
- Allium schoenoprasum sibericum* Linnaeus, Chives. Baileytown, low open wooded dune. Not far from an abandoned house, probably an escape.
- Erythronium americanum* Ker, Yellow Adder-tongue. Keiser, subdunal woods only locality so far found, not common.
- Clintonia borealis* (Aiton), Yellow Clintonia. Baileytown, in a White Pine inland interdunal swamp, not far north of the New York Central tracks. A rather vigorous colony growing in what appears to be a strange situation for the plant, wet swampy woods. The plants are in a solid mass. On May 12, 1929, none of the plants was in flower, but the buds were just ready to open; on May 29, 1929, the flowers were rapidly dropping their petals. This colony is probably the one referred to as "one mile east of Dune Park" by Pepoon, Annotated Flora of the Chicago Area, p. 223, 1927. In the same swampy woods there is found also *Coptis trifoliata*.
- Cypripedium pubescens* Willdenow, Large Yellow Ladies' Slipper. In the original list I followed Britton and Brown, (Illustrated Flora, Ed. 2) who regard the two described forms of Yellow Ladies' Slippers as identical. The question was asked why I did not record both species. In Gray's Manual, ed. 7, one form is regarded as a variety of the other and the two forms are said to be frequently indistinguishable. House (Annotated List of the Ferns and Flowering Plants of New York State p. 235, 1924) gives both forms specific rank, but says that "Seemingly intermediate forms are not rare." In my herbarium are seven specimens of Yellow Ladies' Slipper which readily fall into two fairly well marked groups, a small flowered one, with reddish brown flowers aside from the "slipper" and narrower leaves; and a large flowered one with light colored flowers and large wide leaves. The small flowered forms are found in wet situations while the large flowered forms are found on higher ground and in ordinary woods. Localities and habitats of the seven specimens:

Cypripedium parviflorum, La Grange Co., Pigeon River tamarack swamp, slipper very small, rest of flower dark, leaves moderately narrow.

Cypripedium parviflorum, dunes at Furnessville, moist subdunal woods, slipper medium, rest of flower dark, leaves narrow.

Cypripedium parviflorum, wet subdunal woods at Tremont, slipper medium, rest of flower not dark, leaves narrow.

Cypripedium pubescens, slipper medium, rest of flower light, leaves wide. North and drier portion of Mineral Springs tamarack swamp.

Cypripedium pubescens, two specimens, slipper large, rest of flower light, leaves wide, Furnessville "woods," "damp woods."

Cypripedium pubescens, fruiting specimen, leaves very large and wide, densely wooded dune, Mineral Springs.

The plant from Tremont is unusual in bearing two flowers. The specimen from the Mineral Springs tamarack swamp collected in 1929, is the first one that I have seen there. All four Ladies' Slippers are found in that interesting swamp.

Lysias hookeriana (Torrey), Hooker's Orchid. Tremont, rich wooded dune. A single flowering plant found. Three or four times non-flowering plants, apparently of this species have been found. Capt. C. H. Robinson told me a few plants are to be found in the subdunal woods at Furnessville. The single specimen collected was in early flowering condition June 10.

Liparis Loeselii (Linnaeus), Loesel's Twayblade. Baileytown, Wickliffe, in moist subdunal and interdunal situations. Not common.

Populus alba Linnaeus, White Poplar. Baileytown, near an abandoned house near the New York Central tracks. Evidently introduced, doing well and spreading.

Adicea fontana Lunell, Bog Clearweed. Mineral Springs, quaking bog. This is a dwarf plant, with large dark colored seeds. See Lyon Proc. Indiana Acad. Sci. Vol. 37, p. 403 (1928)

Allionia nictaginea Michaux, Heart-leaved Umbrella-wort. Wickliffe, New York Central tracks.

Melilotus officinalis Linnaeus, Yellow Meliot. Baileytown, New York Central tracks.

Polygala viridescens Linnaeus, Purple Milkwort. Furnessville, ditch by South Shore Line.

Acer Nuttallii (Nieuwland), Purple-twiggged Box-elder. Furnessville, subdunal along the South Shore tracks. A single tree.

Hydrocotyle umbellata Linnaeus, Umbellate Marsh-pennywort. Wickliffe, sandy margin, east end of Long Lake.

Sabbatia angularis Linnaeus, Square-stemmed Sabbatia. Wickliffe,

- interdunal meadows, rather common; Mineral Springs, interdunal meadow, rare.
- Dasystephana puberula* (Michaux), Downy Gentian. Wickliffe, low wooded dune, edge of interdunal meadow. Rare, only three plants found.
- Convolvulus arvensis* Linnaeus, Field Bindweed. Wickliffe, along the railroad tracks.
- Leonurus cardiaca* Linnaeus, Motherwort. Baileytown, subdunal roadside.
- Satureja hortensis* Linnaeus, Savory. Mineral Springs, low and flat. Nieuwland Herbarium.
- Utricularia minor* Linnaeus, Lesser Bladderwort. Mineral Springs, wet sand of interdunal meadow, associated with *Lycopodium inundatum* and *Drosera intermedia*.
- Thalesia fasciculata* (Nuttall), Clustered Cancer-root. Dune Park, open wooded dune side. About a half dozen plants found, growing attached to *Artemesia caudata*.
- Solidago ohioensis* Riddell, Ohio Golden-rod. Mineral Springs, subdunal meadow. Common in that one meadow, not noticed elsewhere.
- Solidago latifolia* Linnaeus, Broad-leaved Goldenrod. Furnessville, dense subdunal woods, south of marsh.
- Aster ptarmicoides* (Nees), Upland White Aster. Wickliffe, low wooded dune.
- Aster sericeus* Ventenat, Silky Aster. Wickliffe, dry low, open wooded dunes, common. Baileytown, similar situation, much less common. Not noticed further east.
- Antennaria occidentalis* Greene, Western Cat-foot. Tremont, wooded dune. This species and *A. fallax* are very close to one another, and difficult to distinguish. Both species were identified by Chas. C. Deam.
- Bidens frondosa* Linnaeus, Beggar-ticks. Keiser, moist subdunal region.
- Coreopsis crassifolia* Aiton, Hairy tickseed. Dune Park, Wickliffe, interdunal meadows. Occasionally found growing almost by the side of *C. lanceolata*. Not so common as *C. lanceolata*. These two species are so much alike aside from smoothness and hairiness that one wonders if they are not dimorphic forms of the same species, similar to the well known color dimorphism of certain animals, or to the "smooth" and "rough" form of certain bacteria.
- Senecio pauperculus balsamitae* (Muhlenberg) Balsam Ragwort. Dune Park, edge interdunal pond. Wickliffe, low open wooded dune.

SPECIES TO BE DELETED FROM THE ORIGINAL LIST

- Calamovilfa longifolia magna* Scribner and Merrill, Regarded by Deam, Grasses of Indiana p. 143 as only robust plants of *C. longifolia*.
- Panicum depauperatum* Muhlenberg, Starved Panic Grass. The specimens upon which this record was established have been determined by Deam, Grasses of Indiana, p. 256, as *P. d. psilophyllum* Fernald.
- Panicum mattamuskeetense* Ashe, One of the specimens upon which the record was based has been re-determined by Deam, Grasses of Indiana, p. 334, as *P. Addisonii* Nash.
- Panicum tennesseense* Ashe, Tennessee Panic Grass. The material on which I recorded this species in the original list has been reidentified by Deam as *P. meridionale* Ashe, a species of the original list.
- Artemesia canadensis* Michaux, This identification was questioned by Chas. C. Deam and D. C. Peattie. My specimens were sent to the latter who compared them with *A. canadensis* in the Field Museum of Natural History. He found they were merely *A. caudata*. The specimens referred to as *A. canadensis* have much larger heads than have my other specimens of *A. caudata*. *Artemesia canadensis* is listed by Coulter, Flowering Plants and Ferns of Indiana, p. 996, as occurring in the region under consideration. Pepon, Flora of the Chicago Area, p. 516, also records it. Deam doubts if it is found in Indiana.

ADDITIONAL REMARKS ON SOME OF THE SPECIES OF THE ORIGINAL LIST

- Lycopodium inundatum* Linnaeus, Bog Club-moss. Also in subdunal meadow at Furnessville. A very few plants not collected nor distributed in an interdunal meadow at Mineral Springs.
- Hypoxis hirsuta* Linnaeus, Yellow Star-Grass. Reported as rare in the original list, it was common in the spring of 1928 in the same locality where the first plant was found. Also collected in an interdunal meadow at Dune Park.
- Lilium umbellatum* Pursh, Western Red Lily. Collected along railroad at Wickliffe, and in meadows near Walker Lake; in fruit on a wooded dune at Mineral Springs.
- Xyris flexuosa* Muhlenberg, Slender Yellow-eyed Grass. Rather common in most moist open situations, collected at Furnessville, Long Lake, Port Chester, Baileytown.
- Cypripedium acaule* Aiton, Moccasin Flower. In addition to the scattered colony of about a dozen plants in the woods at Tamarack Station, a slightly larger and more compact colony was found farther

- east in the same woods. Flowering season just before Memorial Day.
- Gymnadeniopsis clavellata* (Michaux), Small Green Wood Orchid. Regarded as rare in the original list. Subsequently found in many moist situations: Baileytown, subdunal and interdunal meadows; Mineral Springs, interdunal meadow; Port Chester, subdunal meadow; Tremont, subdunal woods; Furnessville, subdunal meadow; Keiser, subdunal woods.
- Perularia flava* (Linnaeus), Small Pale Green Orchid. Found in the subdunal woods at Tremont as well as at Keiser.
- Blepharoglottis lacera* (Michaux), Ragged Orchid. Additional localities, interdunal meadow near Walker Lake; Wickliffe, ditch by railroad; Keiser, ditch by railroad.
- Blepharoglottis psychodes* (Linnaeus), Purple-fringed Orchid. Tamarack, subdunal woods, a single plant.
- Ibidicum cernuum* (Linnaeus), Nodding Ladies' Tresses. Dates of flowering varying from 27 July to 12 October, most abundant during September.
- Peranium pubescens* (Willdenow), Downy Rattlesnake Plantain. A rare plant or two found in the Keiser and Tamarack subdunal woods.
- Betula lutea* Michaux, Yellow Birch. Also found at Baileytown, subdunal; Oak Hill, interdunal.
- Betula pumila* Linnaeus, Low Birch. Also in subdunal marsh at Tamarack Station.
- Castalia odorata* (Dryand), White Water Lily. Common in Long Lake.
- Coptis trifolia* (Linnaeus), Gold-thread. Also found in the *Clintonia* White Pine Swamp at Baileytown, and in a small grove of Yellow Birches at Oak Hill.
- Sanguinaria canadensis* Linnaeus, Bloodroot. Also in the subdunal woods at Keiser.
- Drosera rotundifolia* Linnaeus, Round-leaved Sundew. Also Baileytown, interdunal pond; Port Chester, subdunal marsh; Furnessville, subdunal meadow, the latter the only place where we have found Sundew within the State Park.
- Drosera intermedia* Hayne, Spatulate-leaved Sundew. Also at Baileytown, interdunal meadow, and Mineral Springs, interdunal meadow.
- Comarum palustre* Linnaeus. Also at Tremont, Dune Park and Wickliffe in marshy places.
- Lathyrus maritimus* (Linnaeus), Beach Pea. Also inland open sand at Dune Park, remote from the lake front.
- Glycine apios* Linnaeus, Wild Bean. Ranges from Tamarack to Wickliffe.
- Viola sagittata* Aiton, Arrow-leaved Violet. Also at Tamarack, Baileytown, Wickliffe.

- Viola primulifolia* Linnaeus, Primrose-leaved Violet. Also in the subdunal marsh and woods at Tamarack, infrequent.
- Viola pallens* (Banks), Northern White Violet. A white violet of this genreal type is found in most of the wet subdunal woods of the dunes region. My specimens are from Tremont, Mineral Springs, Tamarack, Keiser, Furnessville. They are all apparently the same species and glabrous. They seem to be the same as specimens of White Violets in the Deam Hearbarium from the Mineral Springs woods which were identified by Brainerd as *Viola incognita* var *Forbesii*. No violets of this type have been found in open meadows.
- Gentiana crinita* Froelich, Fringed Gentian. Fairly common at Wickliffe in interdunal meadows; much more common in the Port Chester interdunal meadow than when first found; probably because hikers are kept out.
- Bartonia virginica* (Linnaeus), Yellow Bartonia. Fairly common in suitable situations from Tamarack to Baileytown, instead of "rather rare" as previously reported.
- Menyanthes trifoliata* Linnaeus, Buckbean. Many plants along the marshy edge of Long Lake.
- Agalinis paupercula* (A. Gray), Small-flowered Purple Gerardia. Also Wickliffe, interdunal meadow.
- Agalinis tenuifolia* (Vahl), Slender Purple Gerardia. Also at Keiser subdunal.
- Castilleja coccinea* (Linnaeus), Scarlet Painted Cup. Also at Dune Park.
- Vesicularia purpurea* Walter, Purple Bladderwort. Also at Dune Park and in Long Lake.
- Utricularia macrorrhiza* LeConte, Large Yellow Bladderwort. Also at Dune Park and Long Lake.
- Virburnum affine* Bush, Missouri Virburnum. Also at Baileytown and Wickliffe.
- Lobelia spicata* Lamarck, Pale Spiked Lobelia. Also in meadows at Baileytown.
- Coreopsis lanceolata* Linnaeus, Lance-leaved Tickseed. Also at Dune Park, Baileytown, Wickliffe.
- Senecio plattensis* Nuttall, Prairie Ragwort. What appears to be this species is found in meadows at Dune Park.
- Senecio aureus* Linnaeus, Golden Ragwort. Also in subdunal and dunal woods at Mineral Springs, but not common.

BOTANICAL GLEANINGS IN MICHIGAN

VII.

OLIVER ATKINS FARWELL

The season was opened by an excursion to Northville and Plymouth. The day was cloudy at the beginning and we ran into a shower almost at the start, but it was over before we were much more than dampened, and after awhile the sun came out and the day became ideal. We found a Hop Horn-bean that was 52.5 inches in circumference, 4 feet from the ground—the largest we had ever seen.

We found a bird's nest tucked away amongst the roots of a fallen sod in a gravel pit; the grass overhung the edges of the sod, but the nest was conspicuous on account of the large, round hole which formed its entrance; it was lined with horse hair and contained two copiously brown spotted eggs. No bird was seen, as it probably was away foraging for a breakfast. It may have been a Horned Lark's nest. One was seen on the road within a mile, more or less, of the place.

In a sugar bush near Plymouth we found an abandoned sugar outfit; how long it had been abandoned would be hard to tell. The pails by the hundreds were still in place on the trees all filled with water, and badly weather-worn and rusted. The pails had been in position at least a year, and most probably several years. Evidently at some time in the past a sugar camp had been established there, and then, for some reason unknown to us, had suddenly been abandoned in the midst of operations. We found a few plants of a white flowered *Trillium* in bud; also a week later in Livonia, where they were just beginning to open. In Livonia, the outer surfaces of the ovate petals were purplish, and this color was more or less further developed during pressing. The peduncles are less than an inch long, thick, and strongly recurved under the

leaves. The filaments are less than .5 the length of the anthers. These plants thus contain features that are characteristic of both *T. cernuum* and *T. declinatum*, and afford very good grounds for believing that they constitute but one species. Using the key in the "Illustrated Flora" these plants would naturally fall into *T. cernuum*; using Gray's New Manual, they would fall into either *T. cernuum* or *T. declinatum*, according to whether you placed more reliance upon the character of the peduncles or upon the relative lengths of filament and anther.

On May 7th, we botanized in the northern part of Livonia township. Plants, perhaps not rare in Michigan, but usually overlooked, are *Floerkea Proserpinacoides* and *Erigenia bulbosa*. Perhaps the rarest plant in southeast Michigan, *Isopyrum biternatum*, was found in prime condition. In a field at some time pastured or cultivated, we found a lone sugar maple that measured three feet in diameter, four feet from the ground, an unusually large size for this species in this region. It was under this tree that *Carex communis* var. *gynandra* was discovered. *Phlox divaricata* was abundant, but the purple and white flowered forms were scarce. In the white flowered form, some of the plants have essentially white flowers, but on close inspection these will show a faint tinge of bluish color; such flowers will, during the process of drying and pressing, become blue and indistinguishable from the typical blue type. A note regarding the color of the fresh or living plant should accompany them. Pure white flowers will not change color during pressing. A small patch of Adam-and-Eve, as the manuals term it, was found. The leaves were in prime condition and the flower stalks were well started, being from two to three inches high. Local botanists hereabouts call it "Adam-and-Eve-and-The Devil."

Livonia township is one of the few places left in southeastern Michigan that is not subdivided, fenced in, and posted. It is a botanist's paradise. Here I found *Carex debilis* var. *Rudgei*, the only place I have found it in southern Michigan

in thirty-nine years of constant botanizing. It is a wonderful *Carex* region. In a Tamarack swamp, in Oakland Co., we found some rare willows, *S. Clarkei* and *S. candida* var. *denudata*. I wish to heartily thank Mr. Rehder, of the Arnold Arboretum, for confirmation of the identifications.

August was very dry from a prolonged drought. Fires were common and herbage generally wilted and dried up. In Livonia township where we found a new station for the naturalized Tree-of-Heaven, it was necessary to climb a tree for the fruit which was successfully accomplished; but the climbing did not come as easily as it did fifty years ago.

I tender hearty thanks to Dr. Rydberg, of the New York Botanical Garden, for the identification of a small, white-rayed *Achillea Asplenifolia*.

Where the year is not given, it is to be understood that the year is 1929 and the collectors, Gladewitz and Farwell.

Botrychium dissectum Sprengl. Grape Fern. Rattle Snake Fern. We found this species, together with the following varieties, in a piece of woods in Livonia township, Oct. 1. There was a score of plants, more or less, that we observed; the dissected variety was more numerous than the sum total of the others. At Farmington the condition is reversed. Livonia, No. 8621, Oct. 1. Farmington, No. 8629, Oct. 8.

Var. *elongatum* (Gilb. & Haberer) Farw. Livonia, No. 8619, Oct. 1. Farmington, No. 8630, Oct. 8.

Var. *obliquum* (Muhl.) Clute. Livonia, No. 8620, Oct. 1.

Var. *Oneidense* (Gilb.) Farw. Livonia, No. 8618, Oct. 1.

Hippochaete variegata (Schleich) Farw., var. *anceps* (Milde) Farw. Forming dense masses and of low stature in moist calcareous grounds. Plymouth, No. 8380, May 30.

Var. *Jesupi* (A. A. Eaton) Farw. Railroad banks near Rochester. Not frequent. No. 8586, Sept. 10.

H. laevigata (A. Br.) Farwell. Abundant in calcareous grounds at Farmington. Could not find fruit on any of the stems which were simple or plentifully branched with the teeth of the leaves often persistent. No. 8625, Oct. 8. With this, and equally abundant, were *H. prealta* var. *pseudohye-*

malis and var. *scabrella*. These were in good fruiting condition.

Typha angustifolia Linn. Cat Tail Flag. Frequent in the southeast section of the state. Plymouth, No. 8449, July 2.

Var. *inequalis* Kronfeld. The staminate spike is much longer than the pistillate. Occasional in the range of the type. Plymouth, No. 8450, July 2.

T. latifolia L., var. *elatior* (Boreau) Graebner. Both spikes are very short, of equal length, and the leaves are very narrow for this species. Frequent in the range of the species. Plymouth, No. 8452, July 2. In this section it is more frequent than the species No. 8451.

Bromus racemosus Linn, var. *commutatus* (Schrad.) Hk. f. Brome or Chess. Roadsides at Delhi; rare. No. 8435, June 25, 1929. Plymouth, No. 8443, July 2.

Festuca ovina Linn, var. *pollyphylla* Vasey. *F. occidentalis* Hk. Rocky woods at Copper Harbor. The old plants take on a reddish hue. Nos. 8493 and 8496, July 24, 1929.

Festuca elatior Linn. Meadow Fescue. A tall, coarse grass with a long, compound panicle. Lake Linden, No. 8484, July 18, 1929.

Var. *pratensis* (Huds.) A. Gr. Smaller and more slender, panicle mostly simple. Lake Linden, No. 8486, July 18, 1929.

Poa palustris Linn. False Red Top. Wet meadows. A coarse grass with a rather stiff open panicle of three-flowered, greenish, or red florets. *P. serotina* Ehrh. *P. triflora* Gilib. *P. effusa* Kit. Lake Linden, No. 8485, July 18, 1929. Bloomfield, No. 4995, June 29, 1918.

Var. *fertilis* (Host) Asch. and Graebn. *P. fertilis* Host. A more slender, weaker plant of open woods with a flexible, more contracted panicle of pale green, two-flowered florets. Copper Harbor, No. 8501, July 24, 1929. Detroit: No. 387a, June 27, 1893; No. 387b, July 7, 1893; No. 5668, August 29, 1920.

Bromelica striata (Mx.) Farwell. Oat-Grass. In rocky woods throughout the Keweenaw Peninsula, but not abundant. Copper Harbor, No. 8495, July 24, 1929.

Agropyron repens (Linn) Beauv. Quack Grass. Couch Grass. Dog Grass. The bright yellow rhizomes are extensively used in medicinal practice under the titles "Triticum" and "Couch Grass." It is, perhaps, the most pernicious weed in America. Rhizomes that have not yet produced culms are white (do not turn yellow on drying) and the internodes are covered with sheathing rose red scales of their own length. Only the older rhizomes that have produced culms are yellow. Lake Linden, No. 8482, July 18, 1929.

Agropyron repens (L.) Beauv., var. *glaucum* (Doell) n. comb. *Triticum repens* Linn, var. *glaucum* Doell. *Agropyrum repens* var. *Bromiforme* Schur. *Agriopyrum repens* (L.) Beauv., var. *glaucum* (Doell) Volkart ex Hegi.

Upper parts of plant (leaves, sheaths, culm and spike) conspicuously glaucous; upper surface of leaves pilose; lemma bearing an awn as long or longer than itself; lemma about 4.5 lines long, and its awn about 5 lines long. Plant slender, as are the spikes; spikelets rather loose. Plentiful along the M. C. right of way at Ann Arbor and to the westward of it. Perhaps, on account of its glaucousness, apt to be mistaken for the next species. No. 8431, June 25, 1929.

A. repens (L.) Beauv., var. *Leersianum* (Wulf. and Schreb.) Reichb. (var. *nemorale* Anders.) Somewhat of the aspect of var. *glaucum* but green instead of glaucous; the leaves are broader and scabrous above instead of pilose. I suspect they intergrade or hybridize, as I observed plants that undoubtedly were intermediate. With the preceding, No. 8432. Lake Linden, No. 8481, July 18, 1929.

A. Missuricum (Spreng.) n. comb. *Triticum Missuricum* Spreng. Syst. Veg. (1825) I, 325. *Ag. spicatum* Scribn. and Sm.; *Ag. Smithii* Rydb. Sprengel wrongfully referred to this species the *Festuca spicata* Ph. and Scribner and Smith, evidently following Sprengel, used Pursh's specific name for this species without taking the trouble to verify it. Sprengel's description unmistakably applies to this species and, in so far as I am able to determine, his description and name are the

first applying to it. Culms scattered or often in tufts. With the preceding No. 8433.

Asperella Hystrix (L.) Humb., var. *Bigeloviana* Fernald. In copses at Livonia. The typical species was also observed here but not collected. The variety is a coarser and taller plant. No. 8542, Aug. 20.

Aira flexuosa Linn. Hair Grass. Along streams near Lake Linden, A. A. Brockway and O. A. Farwell, No. 8487, July 18, 1929, and along rocky shores at Copper Harbor, No. 8494, July 24, 1929.

A. caespitosa Linn, var. *glauca* Hartm. Rocky woods. Not as abundant as the preceding. Copper Harbor, No. 8492, July 24, 1929.

Danthonia spicata (L.) Beauv., var. *pinetorum* Piper. *D. thermalis* Scribn. Wild Oat Grass. Glumes 4 to 6 lines long. Lemmas 2 to 2.5 lines long, of which the triangular, acute, or acuminate teeth are 1 line or less, pilose on the back. The sheaths and upper sides of the leaves are papillately pilose. Rocky woods, Copper Harbor, No. 8491, July 24, 1929; Eagle Harbor, No. 6632, Aug. 29, 1923.

D. compressa Austin. Glumes about 5 lines long. Lemmas about 3 lines long, of which the aristate teeth are 1.5 lines. Leaves and sheaths (except at the apex) essentially glabrous, the blades either flat with a revolute margin or involute. Sand dunes, Five-Mile Point, No. 8529, July 31, 1929.

Calamagrostis Canadensis (Mx.) Beauv. Blue Joint. Banks of streams and marshy situations. Abundant everywhere in marshy places. Rochester, No. 8580, Sept. 10.

Var. *acuminata* Vasey. Florets longer and glumes acuminate. Five Mile Point, Keweenaw Co., No. 8524, July 31, 1929.

Anthoxanthum odoratum Linn. Sweet Vernal Grass. Plentiful at Copper Falls, Eagle Harbor and Central Mine in the Copper District. No. 8504, July 24, 1929.

Eleocharis palustris (Linn) R. & S. *Spike Rush*. This species has been the subject of a prolonged study by Mr. Fernald and Miss Bracket, and they have recognized for North Amer-

ica eight species and two varieties. I have collected in Michigan the following:

E. palustris (Linn) R. & S., var. *major* (Sonder) Fern. & Brack. Keweenaw Co., No. 675, Sept. 6, 1888; No. 773, July 25, 1890; No. 841½, Aug. 22-30, 1894.

Var. *glaucescens* A. Gr., ex descr. and excluding the synonymy. *Scirpus glaucus* Torr. A very slender variety. Bristles present. Belle Isle, No. 1976c, June 30, 1906. Tacoma, No. 4270, July 2, 1916. In their recent monograph of the "Palustres," Fernald & Bracket unite *Scirpus glaucus* Torr., with bristles as long as the achene and tubercle, with *Eleocharis calva* Torr. (under this latter name), with no bristles. The presence or absence of bristles and their roughness or smoothness seem to be generally accepted as good varietal characters in certain genera of the Cyperaceae: thus, we have *E. intermedia* var. *Habereri* Fernald; *Rynchospora capillacea* var. *leviseta* E. J. Hill; *E. Engelmanni* var. *detonsa* A. Gray, etc. The variation of this variety without bristles or these rudimentary should be recognized, and I propose for it subvarietal rank, as follows:

Subvar. *calva* (Torr.) n. comb. *Eleocharis calva* Torr.: *E. palustris* var. *calva* (Torr.) A. Gr. Ann Arbor, No. 8436, June 25. Also Belle Isle, No. 1976d, June 30, 1906 (tall and slender); No. 1984½, July 19, 1906 (rather low and stiff). Monroe Piers, No. 5477, June 3, 1920 (low and stiff). Grosse Pointe, No. 1988, July 21, 1906.

Eleocharis glaucesens (Willd.) Schultes. *E. acuminata* (Muhl.) Nees; *E. compressa* Sulliv. A careful study of Willdenow's description seems to leave no doubt as to what plant is described, regardless of what specimen is now in the Willdenowian herbarium, or how it has been identified. Willdenow's description calls for a plant with 3 stigmas and a compressed stem, and altogether I know of no other species that so well answers to it. *Scirpus glaucesens* Willd., as to the description, is this species. The herbarium specimen according to Fernald has been identified by A. Gray as *E.*

palustris. *E. palustris* or some of its varieties may have three stigmas, but I have never been so fortunate as to observe such. Keweenaw Co., No. 548, Aug. 22, 1887.

Carex scoparia Schk. Lake Linden, No. 8480, July 18, 1929.

C. Crawfordii Fernald. Abundant in meadows near Lake Linden. The most frequent sedge of this group in the Copper District. No. 8478, July 18, 1929. No. 8508, July 29, 1929.

Var. *vigens* Fernald. This variety and *C. scoparia* in this region are infrequent as compared with *C. Crawfordii*. Lake Linden, No. 8507, July 29, 1929.

C. mirabilis Dew., var. *tincta* Fernald. In a moist meadow near Lake Linden in association with *Iris Virginica* var. *robusta*, *Poa palustris*, *Carex Crawfordii* and *Equisetum palustre*. No. 8509, July 29, 1929.

C. tribuloides Wahl. A species frequent in moist swales and on borders of thickets. The two varieties as a rule may be found in the same location as the species; but sometimes one or the other is not to be found. S. w. St. Clair Co., No. 8556, Aug. 27. Also Keweenaw Co., No. 753, July 12, 1890. Ypsilanti, No. 753a, July 23, 1891. Belle Isle, No. 789a, July 21, 1892. Dearborn, No. 5028h, July 6, 1918. Junior, No. 5066, July 13, 1918. S. Rockwood, No. 5866. June 14 and July 12, 1921.

Var. *turbata* Bailey. Less frequent than the species. Spikes oblong obovate, scattered. S. w. St. Clair Co., No. 8557, Aug. 27. Also Keweenaw Co., No. 789, Aug. 18, 1890. Ypsilanti, No. 789b, July 23, 1891. Belle Isle, No. 789c, July 11, 1901. Dearborn, No. 4519a, July 8, 1917. S. Rockwood, No. 5867, June 14 and July 12, 1921.

Var. *reducta* Bailey. Inflorescence moniliform; spikes globular on a conspicuously contracted pedicel-like sterile portion. Frequent. S. w. St. Clair Co., No. 8559, Aug. 27. Also Keweenaw Co., No. 685, Sept. 10, 1888. Belle Isle, No. 683½, July 21, 1892, and No. 683 1/3, July 27, 1893. Dearborn, No. 5025ee, July 6, 1918. Junior, No. 5067, July 13, 1918. S. Rockwood, No. 5865, June 14 and July 12, 1921.

C. virescens Muhl., var. *enormis* n. var. Intermediate be-

tween the species and the variety *Swanii* with the tall culms of the former and the perigynia of the latter, and spikes of both; the culms are as long as 54 inches, lying flat upon the ground, straw colored; the short stem-leaves are about 6, the uppermost anywhere from 6 to 26 inches below the inflorescence, about 1.5 lines wide, intermediate between those of the specific type (2 lines wide), and those of the variety *Swanii* (1 line wide); the radical leaves are one-half the length of the culm or less; spikes oblong-cylindric to subglobose, the terminal 7 to 14 lines long, and the lateral 2 to 14. In the var. *Swanii* the plant is up to 1.5 feet in height, but usually much lower; the radical leaves are longer than the culm, both deep green, erect but flexible; in this variety both culms and leaves are spreading upon the ground and the straw colored culms are twice or more longer than the leaves. Moist woods, thickets, and on moist banks in clearings. Livonia, No. 8550, Aug. 20. In S. w. St. Clair Co., No. 8564, Aug. 27. Previously reported as a gigantic form of var. *Swanii* at Eloise, No. 8026, July 27, 1927.

C. communis Bailey. Plymouth, No. 8306a, April 30; Livonia, No. 8323, May 7.

C. communis Bailey, var. *gynandra* n. var. All spikes green, the terminal more or less completely pistillate. Livonia, No. 8318, May 7.

C. pedunculata Muhl. Infrequent. In woods at Livonia, No. 8322, May 7.

C. Plantaginea Lam. In the same woods as *C. pedunculata* and about as infrequent; No. 8331, May 7.

C. laxiculmis Schw., var. *copulata* (Bailey) Fernald. Rich woods in Livonia township; rare. No. 8418, June 11.

C. Hitchcockiana Dew. In rich woods at Livonia, No. 8460, July 9.

C. debilis Mx., var. *Rudgei* Bailey. Open tickets at Livonia. Rare. No. 8403, June 11; (young flowering specimen). No. 8459, July 9.

C. scabrata Schw. In wet glades at Livonia; No. 8419, June 11.

C. hystericina Muhl. Very variable. Often as low as 4 inches in height and from that to over two feet. Pistillate spikes from sub-globular, and $\frac{1}{4}$ inch long to oblong, and $1\frac{1}{4}$ inches long. The low plants are yellowish, with yellow, subsessile spikes; plants over 15 inches in height are generally greenish, with green spikes, the lowest drooping on a long filiform pedicle. The low yellow spiked plants approach the var. *Cooleyi* Dew. Plymouth, No. 8447, July 2. The larger, green spiked plants are typical of the species; Livonia, No. 8457, July 9.

Var. *Dudleyi* Bailey. Pistillate spikes narrower, cylindrical, over $1\frac{1}{2}$ inches long, otherwise like the typical form of the species. Livonia, No. 8458, July 9.

C. lurida Wahl. Borders of thickets. Southwest St. Clair Co., No. 8568, Aug. 27. Also Keweenaw Co., No. 703, Sept. 20, 1888. Observed at Livonia Sept. 17, but at this time it was too old for collecting.

C. intumescens Rudge, var. *Fernaldii* Bailey. A slender variety in woods. Livonia, No. 8603, Sept. 17.

Arisaema triphyllum (L.) Torr., var. *viride* (Engler) Farw. Quite frequent in southern Michigan. As the only difference between this and the common specific type is one of color, it should rank as a forma:—*f. viride* (Engler) Farw. n. comb. Spathe entirely green. In this species the spathe frequently is rigidly erect instead of curved. Waterford, No. 8297a, April 30; Livonia, No. 8311, May 7, and No. 8359, May 21st.

Var. *pusillum* Peck. Leaves green on both sides, spadix cylindrical. Livonia, No. 8357, May 21st.

Var. *Stewardsonii* (Britt.) n. comb. *Arisaema Stewardsonii* Britt. Similar to var. *pusillum* but the spathe is green with white stripes; agrees in every respect with the characters and description of *A. Stewardsonii* with the exception of the fluting which is not apparent in specimens here. Livonia, No. 8358, May 21.

Juncus filiformis Linn. Rush. A very slender plant, the stems lying almost flat upon the ground. Shores of streams

in rich woods at Five Mile Point, No. 8526, July 31, 1929. Not far from this same location, No. 583, Sept. 5, 1887.

Juncoides pilosum (L.) Coville, var. *Michiganense* Farw. This seems to be the prevailing form of the species in southeastern Michigan. Northville, No. 8290, Apr. 30. Livonia, No. 8325, May 7.

Erythronium Americanum Ker. Yellow Adder's Tongue. At Plymouth we saw acres of this early spring flower that could be counted by the tens of thousands. We saw some very luxuriant specimens, at least for this region; the longest leaves, exclusive of the petioles, were 7 inches in length, and the widest 2 inches in width; root leaves were $2\frac{1}{2}$ inches wide; the largest flowers were $2\frac{1}{16}$ inches in length. No. 8301, April 30; Livonia, No. 8313, May 7.

Var. *Bachii* Farwell. Bach's Adder's Tongue. This color variation has been redescribed and renamed by L. B. Smith in the February, 1929, issue of *Rhodora*, as *E. Americanum* f. *castaneum*. Haven't seen any of it yet this year.

E. albidum Nutt. White Adder's Tongue. In contrast with the Yellow Adder's Tongue, this is conspicuous by its absence. We found a small patch which may have produced a score, more or less, of flowers. It was not associated with the other species, and was in more open and more grassy thickets. No. 8302, April 30.

Unifolium bifolium (L.) Greene. Often called Lily-of-the-Valley. Rich woods at Livonia, No. 8353, May 21.

Trillium erectum L. Purple Beth Root. Very scarce. Livonia, No. 8329, May 7.

T. cernuum L., var. *declinatum* (A. Gr.) Farw. Nodding Beth Root (see pages 46, 47). Waterford, No. 8297, April 30; Livonia, No. 8312, May 7.

Forma *Walpolei* Farw. The peduncle in this is long and reflexed under the leaves parallel with the stem; or at first horizontal just above or just below the leaves. Livonia, No. 8360, May 21.

Iris versicolor Linn. Blue Flag. An abundant plant in low, wet situations and in swampy grounds. The petals are

small, narrow, oblanceolate, and more or less acutish, about as long as the styles. The seeds are in two rows in each cell. The prevailing Blue Flag in the Upper Peninsula. Keweenaw Co., No. 412, July 8, 1886. Lake Linden, Houghton Co., No. 8489, July 23, 1929. The following, not now available for re-examination, were originally identified as this species: Orion, No. 412b, May 30, 1895; Parkedale, No. 2702, June 11, 1912; Algonac, No. 2724, June 16, 1912.

Var. *Virginica* (Linn) Baker. Farwell, in Ann. Rpt. Mich. Acad. Sci. (1913) Vol. XV, 169. *I. Virginica* Linn. *I. Caroliniana* S. Wats. Has larger spatulate, obtuse petals longer than the styles. The seeds are in one row in each cell, or more often one cell has the seeds in two rows. The prevailing Blue Flag in southeastern Michigan. Southwest St. Clair Co., No. 8560, Aug. 27. Belle Isle, No. 412a, June 15, 1893. Originally identified as this variety, but material not now available for re-examination are: Parkedale, No. 2703, June 11, 1912; Algonac, No. 2725, June 16, 1912.

Var. *robusta* (E. Anderson) n. comb. *I. robusta* E. Anderson. Usually this has two petals like those of the specific type and one like those of the var. *Virginica*. The ovules are in two rows in each cell, but abortive, and the capsule falls away from the stalk very quickly after the flower has withered. It may be a hybrid, but the falling of unfructified capsules is not confined to this variety, and it is found with *C. versicolor*, where the variety *Virginica* is unknown. Lake Linden, Houghton Co., No. 8479, July 18, 1929.

In the Journal of Botany for March, 1929, No. 975, pp. 88-90, Mr. J. E. Dandy presents a comprehensive review of Mr. E. Anderson's paper on "The Problem of Species." On page 88, Mr. Dandy says: "The *Iris versicolor* of Gray's Manual, Ed. 7, is really made up of two distinct species. These are *I. versicolor* L., a northern and eastern species, and *I. virginica* L., a predominantly southern and western plant . . ." Such a statement is scarcely in accord with the facts in the case. The *I. versicolor* of Gray's Manual is a single species, as it is with Mr. Anderson. The *I. Virginica* Linn, of Mr.

Anderson, is not a part of *I. versicolor* Linn, as stated by Mr. Dandy; but it is the *I. Caroliniana* of Gray's Manual. Mr. Anderson was dealing with *I. versicolor* Linn and with *I. Caroliniana* S. Wats, both in Gray's Manual, and found that the latter should be known as *I. Virginica* Linn, which is quite a different matter.

Orchis spectabilis Linn. Showy Orchis. Rich woods near Livonia. Only two plants were seen in flower. These woods had been pastured and little was left in them. No. 8362, May 21.

Epipactis tesselata (Lodd.) A. A. Eaton. Rich woods at Five Mile Point, No. 8522, July 31, 1929.

E. pubescens (Willd.) A. A. Eaton. At the same location as the last. Both scarce. Leaves only of this species, but they are quite distinct in their markings. No. 8523.

Aplectrum hyemale (Muhl.) Torr. Adam and Eve. Livonia, No. 8324, May 7.

Salix fragilis Linn. This is the large tree willow of the Copper District; a shade tree that has become more or less established. Calumet, Lake Linden, etc., No. 8483, July 18, 1929.

Salix serissima (Bailey) Fernald. A low shrub allied to *S. lucida*, and usually found in swamps. In flower and a peculiarity of the plant at this time is that it won't key into anything but *S. fragilis* on account of the long gland and short pedicel. In a Tamarack swamp near Due West, No. 8391, June 4.

Salix Clarkei Bebb. With the preceding, No. 8392.

Salix candida Flugge. With the preceding. No. 8393.

Var. *denudata* Anders. This variety is much taller and more robust than the species, at least as it is found in southeastern Michigan, and its glossy green leaves, at least as to the upper surface, give it a very prominently distinct appearance. With the preceding. Nos. 8394, 8395, and 8399. Also Hamburg, No. 6769, Sept. 5, 1923; Goodrich, No. 7650, Sept. 25, 1925.

Salix sericea Sm., var. *subsericea* (Anders.) Rydb. The

leaves, or at least some of them, turn brown or black in drying. They are entire or rarely denticulate, as in *S. petiolaris* var. *gracilis*. Borders of thickets, Livonia, No. 8341, May 14.

Quercus velutina Lam. Black Oak. Roadsides, woods, etc., at Bloomfield, No. 8572, Sept. 3. Rochester, No. 8584, Sept. 10. Dearborn, No. 8639, Oct. 15.

Urtica gracilis Ait., var. *latifolia* n. var. *Urtica Lyallii* Gray's New Manual as to the plants of its region not of S. Wats. Nettle. Compared with *U. gracilis*, the grayish pubescence is longer and denser, the leaves are broader and shorter, more apt to be subcordate, teeth fewer and coarser, more spreading. Lake Linden, No. 8513, July 29, 1929. Previously reported as *U. Lyallii*.

Rumex altissimus Wood. Pale Dock. This has much the appearance of *R. Mexicanus* Meisn. for which it was collected. Near the viaduct where the Dexter Road crosses the M. C. just west of the depot at Ann Arbor. No. 8340, June 25, 1929. Plymouth, No. 8441, July 2.

Polygonum orientale Linn. Prince's Feather. An escape. Roadside near Fenton, No. 8538, Aug. 13.

Stellaria media (L.) Cyrill, var. *sylvatica* Wirtg. A low, variation found in moist depressions and on wet or muddy borders of pools, etc. in woods. Stamens 5, petals as long as the calyx which is more or less pilose, stems red. Livonia, No. 8343, May 14.

Silene dichotoma Ehrh. Sandy grounds near the lake shore at Five Mile Point, Keweenaw Peninsula. Throughout Michigan. No. 8519, July 31, 1929.

Isopyrum bitermatum (Raf.) T. & G. False Rue Anemone. Livonia, No. 8317, May 7.

Hepatica acutiloba DC., var. *variegata* Farw. Beautifully mottled with dark green or brown, mostly along the course of the veins. Plentiful in the woods near Livonia, No. 8326, May 7.

H. Americana (DC.) Ker., var. *maculata* Farw. Plentiful in woods near Livonia, No. 8345, May 14.

Ranunculus Carecitorum Greene. Buttercup. In moist

meadows. Leaves biternate; petals broadly obovate 8-10 lines long. Flower about an inch and three-quarters across. A number of stems arising from the axils of the root leaves, all from one crown. Livonia, No. 8350, May 21.

Ranunculus septentrionalis Poir. Near the preceding; leaves pinnate; petals 4-6 lines long; flower not over an inch across; a number of stems in a clump but each from its own separate crown. Livonia, No. 8351, May 21.

Berberis Thunbergii DC. Barberry. In woods near Farmington where it has become naturalized. No. 8624, Oct. 8.

Adlumia fungosa (Ait.) Greene. A handsome, delicate vine climbing high over tall shrubs. In open, wet woods at Livonia. The first time seen in a wild state. Plentiful in these woods. No. 8467, July 9.

Berteroa incana (L.) DC. Now a common weed in Michigan. Typically the petals are two parted; but they may be emarginate or entire. Livonia, No. 8609, Sept. 24.

Koniga maritima (L.) R. Br. Sweet Alyssum. Occasional along roadsides as an escape from cultivation. Livonia, No. 8608, Sept. 24.

Dentaria laciniata Muhl. Pepper Root. The typical form has three leaves in a whorl with linear or linear-lanceolate leaflets. Plymouth, No. 8306, April 30.

Var. *latifolia* n. var. The leaflets are oblong and broad for the species. With the type, No. 8303.

Var. *opposita* n. var. Leaves two, opposite, otherwise as in the typical form of the species; No. 8304.

Var. *alternata* n. var. Leaves three, alternate, otherwise like the typical form of the species. No. 8305. This species, as it is found in woods near Plymouth, is plentiful and can be divided into four well defined series as outlined above.

Arabis laevigata (Muhl.) Poir., var. *heterophylla* (Nutt.) Farw. Lowermost stem-leaves and the rosette leaves hirsute as is the basal part of the stem. Rosette leaves usually lacinate or pinnatifid. Otherwise like the species. The prevailing variation of the species in southeastern Michigan. Livonia, No. 8420, June 11.

Reseda lutea Linn. Yellow Mignonette. In a field in Livonia township, No. 8416, June 11.

Reseda alba Linn. White Mignonette. I collected this on waste ground in Detroit. No. 1594, Sept. 24, 1897.

Potentilla arguta Ph. The typical plant has golden-yellow flowers; the plants at any station are all of one color. Keweenaw Co., No. 264, July 15, 1885. Ypsilanti, No. 264a, July 23, 1891.

Forma *Agrimonioides* (Ph.) n. comb. *Geum Agrimonioides* Ph. Flowers white. The prevailing form in Michigan. The proper name for the typical species is *P. arguta* Pursh, even though it hasn't priority of place, since that is the name used when both of Pursh's species were first united. Livonia, No. 8468, July 9. Keweenaw Co., No. 783, Aug. 1, 1890. S. Rockwell, No. 5918, July 12, 1891. Detroit, No. 783a, July 12, 1905. Rochester, No. 3053, Aug. 4, 1912.

Rubus Idaeus L., var. *strigosus* (Mx.) Maxim. *R. strigosus* Mx. Red Raspberry. Stems brown, shiny, not glaucous, more or less bluntly prickly; the branches are the same as well as glandular, not pubescent. Leaves coarse, leathery, upper side dark green with more or less brown markings to brown; under side white tomentose. Open fields and shores. Five Mile Point, Keweenaw Co., No. 8520, July 31, 1929.

Var. *Canadensis* Richards. *R. subarcticus* (Greene) Rydb. Stems bristly, dark brown or blackish, dull; branches green, puberulent as well as glandular and bristly; leaves delicate, thin, upper side yellowish green, under side whitish or grayish tomentose to nearly glabrous and green. A plant of shady places; thickets and woods. Lake Linden, Houghton Co., No. 8532, Aug. 1, 1929.

Var. *melanolasius* Focke. *R. melanolasius* Focke. Stems pulplish and glaucous, and more bristly with longer bristles; leaves thick; light green above, densely white tomentose beneath. The common raspberry in southeast Michigan. Rochester, No. 8588, Sept. 10. Livonia, No. 8411, June 11.

R. nigrobaccus Bailey. Blackberry. Abundant in open

thickets. In this region the stems are terete without any sign of being angled. Livonia, No. 8410, June 11 and Aug. 20.

R. pergratus Blanchard. Fruit short oblong to cylindric, 8-11 lines long and of many black, juicy drupelets. Inflorescence racemose, not glandular, but pubescent. Young branches slightly prickly and angled, red. Fenton, No. 8537, Aug. 13.

R. nigricans Rydb. Dewberry. Stems trailing or procumbent in this district, not upright as described by some, retrorsely prickly; inflorescence glandular, corymbiform. Fields at Livonia, No. 8541, Aug. 20.

Pyrus Malus Linn. Apple. This tree is wildly naturalized throughout Michigan. The fruit is often malformed and wormy, but as frequently it is of good shape, and flavor. Frequently the trees bear no fruit. Frequent in Livonia township: No. 8337, May 14, and Sept. 17; Nos. 8354 and 8356, May 21 and Sept. 24; No. 8613, Sept. 24.

P. subvestita (Greene) Farwell. Mountain Ash. In woods at Livonia. No. 8330, May 7, and July 9. Too young for flowering.

P. Americana (Marsh.) DC. American Mountain Ash. Rocky Shore at Five Mile Point, No. 8521, July 31, 1929.

Amelanchier Canadensis (Linn) Medic. (*A. laevis* Wieg.) In a small grove at Northville. This species is comparatively rare. In Michigan, Shad Bush and Sugar Plums are the common names for all the species of this genus; June Berry and Service Berry are rarely heard. Sugar Plum is the most commonly used. No. 8292, April 30. Also Livonia, No. 8310, May 7.

A. Botryapium (L. f.) Borkh. (*A. Canadensis* Wieg. non Medic.) In the same grove as the preceding species. No. 8293, April 30.

Crataegus Linn. Thornapple. Hawthorne. This genus is well distributed through southern Michigan. No systematic study of the species of the whole state has even been made; it would be mere guess work to suggest the number of the named and described species of North America that might be found in Michigan. Dr. Sargent listed 55 species from south-

ern Michigan alone. Loudon divided the genus into a number of sections. One of these is section *Douglasii*, which American botanists have unwarrantably changed to *Douglassianae*. *Douglasii* is, under the Vienna Rules, as proper a sectional name as *Coccineae*, *Crusgalli*, or *Azaroli*. There is no more reason to change *Douglasii* than there is to change *Crus-galli* or *Azaroli* (*Aroniae* Loud.)

Below are the species which I have found in Michigan.

Sect. *Oxyacanthae*, Loud. (*Heterophyllae* Loud.)

C. Oxyacantha Linn, var. *monogyna* (Jacq.) Loud. English Hawthorn. Detroit, No. 1715, June 9, 1901. Grosse Isle, No. 5990, Aug. 31, 1921. At Hadley it is widely distributed, thoroughly naturalized and rapidly spreading; No. 6180, June 14, 1922.

Sect. *Crus-galli*, Loud.

C. Crus-galli Linn. Cockspur Thorn. Fields and pastures. This species has 5 to 15 pink stamens. Belle Isle, No. 1333, Sept. 16, 1892, and in the spring of 1893. Detroit, No. 2597, June 1, 1912.

Var. *attenuata* (Ashe) Farw. *C. Crus-galli* var. *Prunifolia* (Poir.) T. & G. in Rob. and Fern. in Gray's New Manual; *C. attenuata* Ashe; *C. Bartramiana* Sarg. In similar situations. Rochester: No. 8383, June 4 and Sept. 10; also No. 4672, Oct. 7, 1917, and No. 4872, May 28, 1918.

Var. *ovalifolia* (Hornem.) Lindl. [Var. *Prunifolia* (Bosc.) Loud.; also of T. and G., Fl. N. Amer. (1840) I 464; *C. persimilis* Sarg.; *C. Farwellii* Sarg. *C. Crus-galli* X *macracantha* Eggl.] This variety has the corymbs more or less pubescent. Belle Isle: No. 1760, Sept. 25, 1901 and June 4, 1902; No. 1907 1/3, May 29, 1905 (the type of *C. Farwellii*). Parkedale, No. 3231, Oct. 27, 1912. Oxford, No. 7614, Sept. 2, 1925.

C. Arduennae Sarg. This species has 10 yellow stamens. Belle Isle: No. 972b, June 4 and Sept. 18 and 28, 1895; No. 1884; Oct. 13, 1904, and May 29 and Oct. 10, 1905.

C. Jasperensis Sarg. *C. polyclada* Sarg. This has 20 yellow stamens. Rochester, Nos. 8381 and 8384, June 4 and Sept. 10. Also Bloomfield, No. 8198, June 12, 1928, and Sept. 3; Belle Isle, No. 1907b, May 29, 1905.

Sect. *Punctatae*, Loud.

C. punctata Jacq. The type and the var. *canescens* have 20 pink anthers and the var. *aurea* has 20 yellow anthers; the former have dark red fruit, while the latter has yellow fruit. Belle Isle: No. 1357, June 2, 1893, Sept. 24, 1895, and May 29, 1095; No. 1907a, May 29, 1905; No. 1907a, May 29, 1905. Linden Park, Detroit, No. 1893½, May 23, 1905. Birmingham, No. 1357a, June 9, 1901. Parkedale: No. 3229, Oct. 27, 1912; No. 3552, Oct. 5, 1913; No. 3965a, June 6, 1915.

Var. *canescens* Britt. Corymbs, etc., densely white tomentose. In woods on Mack Ave., Detroit, No. 2021, June 16, 1907. Station long since destroyed.

Var. *aurea* Ait. In pastures at Livonia, No. 8615, Oct. 1. Farmington, No. 8628, Oct. 8. Also Linden Park, No. 1909½, June 1, 1905. Rochester: No. 2135, Sept. 6, 1909; No. 3540, Oct. 5, 1913. Parkedale, No. 3551, Oct. 5, 1913. Redford, No. 4749, Oct. 14, 1917.

C. suborbiculata Sarg. *C. nitidula* and *C. Dewingii* Sarg. This species has 20 pink anthers. Linden Park, No. 1884½, Oct. 17, 1904. Rochester, No. 4672a, Oct. 7, 1917. Anchorville, No. 6473, Nov. 5, 1922.

Sect. *Intricatae*, Sarg.

C. straminea Beadle. *C. apposita*, *C. Bisselii*, *C. Wheeleri* and *C. diversifolia*, Sarg. Fenton, No. 8533, Aug. 13. Also Scio, No. 7735, July 21, 1926, and on Belle Isle, No. 1351d, May 16, 1893.

C. Bealii Sarg. Nearly completely unarmed. Wooded hill tops at Livonia, No. 8333, May 14 and Sept. 17.

Sect. *Tenuifoliae*, Sarg.

C. cordifolia (Mill.) n. comb. *C. cordifolia* Mill., Gard. Dict. (1768) Ed. 8, in corrections; *C. cordato* Mill, l. c., sp. No. 4; *C. acutiloba* Sarg. *C. otiosa* Ashe. This species, in one or another of its varieties, is quite abundant. The typical

variety I have seen but once. Belle Isle, No. 1770, May 17, 1902.

Var. *matura* (Sarg.) n. comb. *C. matura* Sarg.; *C. retrusa* Ashe; *C. macrosperma* var. *matura* Eggl. Rochester, No. 8579, Sept. 10. Livonia, Nos. 8611 and 8612, Sept. 24. Also Keweenaw Co., No. 1882a, Oct. 4, 1904.

Var. *borealis* (Ashe) n. comb. *C. borealis* Ashe. Keweenaw Co., on rocky bluffs, No. 117, June 30, 1884, and No. 1882b, Oct. 4, 1904.

Var. *macrosperma* (Ashe) n. comb. *C. macrosperma* Ashe. *C. glaucophylla* Sarg. Along river banks and on wooded hill tops. Livonia: No. 8545, Aug. 20 and Oct. 1; No. 8600, Sept. 17. Also on Belle Isle, No. 1772a, May 19 and Oct. 9, 1902.

Var. *pastorum* (Sarg.) n. comb. *C. pastorum* Sarg.; *C. uber* Ashe; *C. decens* Ashe. *C. macrosperma* var. *pastorum* Eggl. Belle Isle, No. 1772, May 19 and Oct. 9, 1902. Livonia, No. 8597, Sept. 17.

C. Roanensis Ashe. *C. perlaeta* Sarg.; *C. fluviatilis* Sarg.; *C. ascendens* Sarg. Belle Isle, No. 1678, Sept. 7, 1900. Farmington, No. 8626, Oct. 8.

C. Streeteri Sarg. *C. Grayana* Eggl. Farmington, No. 7622, Sept. 9, 1925; and Oct. 8.

C. Alnorum Sarg. *C. Edsoni* Sarg.; *C. merita* Sarg. Goodrich, No. 7637, Sept. 23, 1925. Ortonville, No. 8120, Sept. 21, 1927.

C. tatrix Sarg. Detroit, No. 2595, May 30, 1912.

Sect. *Pruinosae*, Sarg.

C. pruinosa (Wendl.) C. Koch. *C. glareosa* Ashe. Near the old race course, Detroit, No. 1883, Oct. 13, 1904, and May 20 and Sept. 28, 1905. Linden Park, No. 1891c, May 23, 1905. Redford, No. 4863, May 24, 1918. Farmington Junction, No. 8154, Oct. 5, 1927.

Var. *latisejala* (Ashe) Egg. Roadsides at Eames, No. 8141, Sept. 28, 1927. Livonia, No. 8601, Sept. 17.

Var. *Philadelphica* (Sarg.) Eggl. *C. immanis* Ashe. In pasture thickets. Belle Isle, No. 1816, May 24, 1904 and May

18, 1905. Rochester, No. 7664, Sept. 30, 1925 and No. 8581, Sept. 10.

C. horridula Sarg. The leaves are broader than long. Ypsilanti, No. 5454, May 30, 1920.

C. Jesupi Sarg. *C. prona* Ashe. Wooded ravines near Franklin, No. 5162, Sept. 22, 1918.

Sect. *Silvicolae*, Beadle.

C. diffusa Sarg. *C. opulens*, *C. Robbinsiana* and *C. Beckwithae* Sarg. Possibly the same as *C. filipes* Ashe, which, if so, is the older name and the one to be used. Parkedale, No. 3270, Oct. 27, 1912.

Sect. *Rotundifoliae*, Eggl. (*Coccineae* Sarg.)

C. rotundifolia Moench. *C. glandulosa* Ait. non Moench.; *C. Dodgei* Ashe; *C. lumaria* Ashe; *C. Gravesii* Sarg.; *C. fallens* Sarg. Rocky shores of Lake Superior at Marquette, No. 1371a, Aug. 30, 1898.

Sect. *Coccineae*, Loud. (*Flabellatae* Sarg.)

C. coccinae Linn. *C. pedicellata* and *C. caesa* Sarg. Highland Park, No. 865 1-2, May 7, 1896. Belle Isle: No. 880 1-2. Sept. 24, 1895; Sept. 12, 1899; Sept. 24, 1900. Farmington, No. 8627, Oct. 8.

Var. *Ellwangeriana* (Sarg.) Eggl. Thickets. Livonia: No. 8334, May 14 and Sept. 17; No. 8617, Oct. 1. Also Mack Ave., Detroit, No. 2017b, May 26, 1907. Redford, No. 7820, Sept. 22, 1926.

C. albicans Ashe. *C. polita* and *lenta* Sarg. Roadsides at Livonia, No. 8332, May 14, and Sept. 17. Linden Park, No. 1765, Sept. 26, 1901. Shores of Sylvan Lake, No. 7282, Oct. 22, 1924.

Sect. *Molles*, Sarg.

C. Acerifolia Lodd. ex Moench. *C. subvillosa* Schrad. *C. mollis* (T. & G.) Scheele. *C. Tilliaefolia* C. Koch *C. altrix* Ashe. In this species the leaves are thinnish, broadly ovate and cordate; in the variety, oblong-ovate. Ypsilanti, No. 1078, May 27, 1891. Belle Isle: No. 1078b, May 27, 1893; May 16 and Sept. 18, 1895; May 30 and Sept. 7, 1900; May 14, 1902; No. 993a, May 16 and Sept. 18, 1895; May 14 and Sept. 16,

1905; No. 1666a, May 30 and Sept. 7, 1900; May 14 and Sept. 16, 1905. Birmingham, No. 1707 1-2, May 21 and Sept. 1901. Linden Park, Nos. 1891 1-2 and 1892 1-2, May 23, 1905. Rochester, No. 2572, May 19, 1912, and No. 3283, Oct. 27, 1912.

Var. *sera* (Sarg.) n. comb. *C. sera* Sarg. Belle Isle: No. 1759, Sept. 25, 1901; Nos. 1959a and 1959b, May 24, and Oct. 9, 1905.

Leaves thick and orbicular or nearly so, cordate to narrowed at base.

C. redolens Ashe. Belle Isle, No. 1891a, May 14 and Oct. 19, 1905. Birmingham, No. 1796a, June, 1903. La Salle, No. 7166, Sept. 17, 1924. Milan, No. 7308, May 6, 1925.

C. nupera Ashe. *C. nutans* Sarg. Belle Isle: No. 1769, Sept. 24, 1900 and May 17, 1902; No. 1796, Oct. 9, 1902, and May 11, 1903; No. 1891d, May 24 and Oct. 9, 1905.

C. mollipes Sarg. Belle Isle, No. 1891b, May 14 and Sept. 16, 1905; Old Race Course, Detroit. No. 1959c, Oct. 29, 1905. Rochester, No. 6941, July 2, 1924. Livonia, No. 8339, May 14.

Sect. *Douglasii*, Loud. (*Douglasianae* Sarg.)

C. Brockwayae Sarg. A shrub or small tree. The fruit in August before it is ripe is a beautiful wine red; in October when ripe, if my memory serves me rightly, it is purplish with a blue bloom. It has been referred to the Rocky Mountain *C. Douglasii*, but in my estimation it is not that species which has a black fruit without a bloom. Abundant in Keweenaw Co.: No. 116, June 30, 1884, No. 1616a, Aug. 25, 1898; No. 3060, Aug. 22, 1912.

Sect. *Macracanthae*, Loud. (*Tomentosae* Sarg.)

Stamens yellow, 10.

C. glandulosa Moench. *C. macracantha* Lodd. The type of this species often has numerous compound dark chestnut, or blackish thorns 4 to 6 inches long and broad. Redford, No. 4741, Oct. 14, 1917, and May 24, 1918. Northville, No. 6448, Oct. 18, 1922.

Stamens yellow, 20.

Var. *Michiganensis* (Ashe) n. comb. *C. Michiganensis* Ashe. Belle Isle: No. 3376, May 29, 1905; May 24, 1913; Oct.

20, 1917; May 26, 1918. Redford, No. 4740, Oct. 14, 1917 and May 24, 1918.

Stamens pink, 10

Var. *minor* (Loud.) n. comb. *C. macracantha* var. *minor* Loud. *C. rhombifolia* Sarg. Northville, No. 6451, Oct. 18, 1922.

Stamens pink, 20.

Var. *suculenta* (Schrad.) C. Koch. Northville, No. 6450, Oct. 18, 1922. Ypsilanti, No. 7367, May 27 and Oct. 14, 1925.

Var. *neofluvialis* (Ashe.) n. comb. *C. neofluvialis* Ashe. *C. gemmosa* Sarg. Belle Isle: No. 1371, June 18, 1893; Aug. 22 and Sept. 12, 1899; May 30 and Sept. 24, 1900; May 20, 1905; No. 3194, Sept. 26, 1912. River Rouge Park, Gladewitz, Sept. 23, 1929.

C. tomentosa Linn. *C. leucophleas* Moench. Belle Isle: No. 1078a, May 27, 1893 and June 2 and Sept. 12, 1899; No. 1885a, Oct. 18, 1904; No. 1909a, June 6, 1905. Orion, No. 1078c, May 30, 1895. Parkedale No. 3550, Oct. 5, 1913.

Var. *pubifolia* (Ashe) Farwell. *C. pubifolia* Ashe. Livonia, No. 8547, Aug. 20 and Oct. 1. Northville, No. 6452, Oct. 18, 1922. Farmington, Nos. 8153 and 8155, Oct. 5, 1927.

Var. *structilis* (Ashe.) Farwell. *C. structilis* Ashe. The stamens are yellow in this variety. Belle Isle, No. 1365b, June 13, 1893, and June 6 and Sept. 23, 1905; No. 972a, June 4 and Sept. 24, 1895; No. 1712, June 9, 1901 and June 6 and Sept. 23, 1905; No. 1885, Oct. 18, 1904 and June 6 and Oct. 9, 1905. Parkedale: No. 3227, Oct. 27, 1912; No. 4237, June 5, 1916; No. 4418, Sept. 3, 1916.

Since writing the above on *Crataegus*, the following species and varieties were collected at Dearborn Oct. 15.

C. punctata Jacq. One of our abundant species on hill-sides, in fields and copses. Fruit large, dull red. No. 8637. The var. *aurea* Ait., with bright yellow fruit, was observed but not collected.

Var. *nitidula* (Sarg.) n. comb. *C. nitidula*, *C. suborbiculata* and *C. Dewingii* Sarg. Intermediate between the species and

the var. *aurea*, with dull yellow fruit blotched with red. Frequent. No. 8634.

Var. *tenax* (Ashe) n. comb. *C. tenax* Ashe. Distinguished by its long, narrow, glabrate leaves and bright red (crimson) fruit. Analogous to the var. *attenuata* of *C. Crus-galli*. No. 8635.

C. albicans Ashe. A lone tree in upland pastures. A road is being built through the field and the tree probably is doomed. No. 8638.

Var. *Tatnalliana* (Sarg.) n. var. *C. Tatnalliana* Sarg. The underside of the leaves and the pedicels are slightly villose. On the rim of the plain of the Lower River Rouge, No. 8632.

C. Acerifolia Moench. *C. subillosa* Schrad. On the rim of the plain not far from the last above named. No. 8636.

C. nupera Ashe. *C. nutans* Sarg. On the lowlands. The trunk circumference 2 feet from the ground is 74 inches. No. 8633.

Pongelion Cacodendron (Ehrh.) n. comb. *Rhus Cacodendron* Ehrh. *Ailanthus glandulosa* Desf. The tree of Heaven. Another station where this tree has become established as a naturalized plant has been found. Fruit is plentiful on these trees. *Toxicodendron altissimum* Miller has been misidentified as this species, and his specific name applied to it under *Ailanthus*. Miller had *Arbor Vernicifera*, etc., Kemp. 794, the Fasi no Ki, which is *Rhus succedanea* Linn. Miller says he does not know where his species belongs, as it had not yet flowered or fruited, but the synonyms quoted definitely place it. It cannot be impressed for this species. Livonia, No. 8543, Aug. 20.

Floerkea Proserpinacoides Willd. Fake Mermaid. Waterford, No. 8297b, April 30. Livonia, No. 8321, May 7.

Vitis palmata Vahl. (*V. rubra* Mx.) Red Grape. Frequent on banks. Probably generally mistaken for *V. vulpina* Linn. Young branches bright red and fruit black without bloom, the leaves and petioles are more pubescent than in *V. vulpina*, and the sinuses are broad or rounded. Livonia, No. 8453, July 2.

Hypericum mutilum Linn. Abundant in moist fields, ditches, etc. S. w. St. Clair Co., No. 8566, Aug. 27.

Gardenia Virginica (L.) Farwell. Usually found in marshes. It is plentiful in an abandoned garden, not in the least marshy, in S. w. St. Clair Co.; No. 8567, Aug. 27.

Viola obliqua Hill. (*V. affinis* Le Conte; *V. venustula* Greene.) In moist meadows which were sparsely wooded. Livonia, No. 8352 and 8364, May 21.

Var. *crenulata* (Greene) n. comb. *V. crenulata* Greene. Foliage thinner, yellowish green, remotely crenate. Peduncles thinner and more or less translucent. Livonia, No. 8363, May 21.

Viola sagittata Ait., var. *secedens* (Greene) n. comb. *V. secedens* Greene. Plants agree with the original description in all particulars. Quite different in appearance from the var. *subsagittata*. Wayne, No. 7896, May 11, 1927, first reported as *V. fimbriatula*. Livonia, No. 8335, May 14.

V. fimbriatula Sm. var. *aberrans*. (Greene) Stone. Blades rather small for this variety. Fields near Plymouth, No. 8377, May 30.

Viola minuscula Greene. Previously included in *V. pallens*. I would place here my Keweenaw County plant, No. 26, July 6, 1883. On moist, sandy borders of streams; densely massed forming large clumps, but with the small plants as described for this species. Lake Linden, Houghton Co., No. 7463½, July 8, 1925. Oxford, No. 6981, July 23, 1924. Eloise, No. 7406, June 10, 1925.

Viola debilis Mx., f. *Muhlenbergii* (Torr.) Farw. As in *V. rostrata*, this violet also has leaves persisting through the winter and into the flowering season, but not so frequently. Livonia, No. 8307, May 7.

Viola rostrata Pursh. Long Spurred Violet. Has any botanist found leaves of the preceding year present on this species at the spring flowering season? Otherwise, evergreen or semi-evergreen leaves. Mr. Gladewitz found them on this species on April 21, 1929, and showed them to me on the 30th. I at once recognized the fact that I had collected similar spec-

imens but had not recognized *the texture* of the leaves until he called my attention to them. On April 30 we again found them at Plymouth, No. 8299 and at Livonia, No. 8314, May 7. In looking over my collections I find that the ~~two~~ following numbers had leaves that had wintered over. Utica, No. 4501b, June 10, 1917. Rockwood, No. 4147, May 21, 1916.

Forma *Phelpsiae* Fernald. Near Farmington, Mr. Glade-witz, April, 21, 1929. This also had evergreen leaves. So also my Rockwood plant, No. 4146, May 21, 1916 and Livonia, No. 8327, May 7.

Var. *elongata* Farwell. Evergreen leaves are on the Washington plant, No. 6483, May 23, 1923. Livonia, No. 8361, May 21.

Oenothera biennis var. *rubricaulis* Farwell. Stem red, more or less pubescent, with short, curved hairs and longer, spreading ones with a red bulbous base, or nearly glabrous; bracts shorter than the nodding buds and deciduous before the flower opens; or persistent and shorter than the capsules; buds and capsules glabrous to sparsely hirsute. In copses or in fields. Those in copses more apt to have glabrous buds and capsules and deciduous bracts. Livonia, No. 8548, Aug. 20.

Oe. sabulosa n. sp. Simple or sparingly branched at or above the middle, whole plant grayish strigose pubescent, no hairs with a swollen base; leaves small, lanceolate or linear-lanceolate, entire or remotely and minutely denticulate, an inch and a half long or less, two to five lines wide, passing into the bracts of the spike which are shorter than the capsules; capsules linear, a line wide and eight lines long, or cylindrical, three lines wide and eighteen lines long, the same width nearly throughout, tapering only at the apex; whole flower fifteen to twenty-two lines long, the petals five to eight lines long, obovate, pale yellow; appendages of the sepals terminal one-quarter to one and a quarter lines long, appressed (not free). Differs from *Oe. Oakesiana* in its terminal sepal appendages. Found in sand fields. This Michigan sand plant has been included (in literature) in *Oe. strigosa*, *Oe. Oakesiana*, and *Oe. biennis*. Keweenaw Co., No. 721, Sept. 1, 1889. Copper Har-

bor, No. 1616b, August 25, 1898. Woodville, No. 5957, Aug. 4, 1921.

Erigenia bulbosa (Mx.) Nutt. Harbinger of spring. Livonia, No. 8315, May 7.

Uraspermum barbatum n. sp. Perennial, one or two stems from the crown of the root which is not anise scented, or but very faintly so, when fresh. Stems simple or branched, up to 2 or 3 feet in height, the upper part glabrous, the lower part and the foliage more or less spreading or retrorse pilose, the nodes, especially the lower ones, conspicuously bearded with a ring of white hairs about one line long, reflexed and appressed to the stem. Leaves twice ternate, leaflets narrowly ovate to lanceolate, one or two inches long, coarsely toothed and often incised, truncate, rounded or cuneate at the base. Umbells and umbellets bractless, two to four rayed, rays ascending spreading. Fruit bristly, ten or eleven lines long, beaked, the styles and stylopodium conic, together about five tenths of a line long. Compared with the descriptions of other species, it seems to be allied to *U. brevipes** on the one hand, and to *U. divaricata** on the other, differing from the former in its shorter pedicles and from both in its bearded nodes, a character I have not observed in any other species known to me or seen attributed to any other in description. Rocky woods, Copper Harbor, No. 8490, July 24, 1929.

**Uraspermum brevipes* (Coult. & Rose) n. comb. *Washingtonia brevipes* Coulter & Rose.

**U. divaricata* (Nutt.) n. comb. *Osmorrhiza divaricata* Nutt. *W. divaricata* (Nutt.) Britt.

Chimaphila umbellata (L.) Barton in part. *C. corymbosa* Ph. in part. Prince's Pine. Pipsissewa. Pursh's specific name is simply a substitute name for the Linnaean *umbellata*; he did not construe the American plant as a distinct species, and rightly so, as the only difference is in the color of the flowers, the European being rose and the American greenish white, with a tinge of rose. Both Barton and Pursh included both the European and American plants in their species. The names apply typically to the European plant.

Aug. Forma *Americana* n. f. Flowers greenish white tinged with rose. *C. umbellata* (L.) Barton and *C. corymbosa* Pursh, each as to the American plants. Frequent throughout Michigan in dry, sandy or rocky woods. Keweenaw Co., No. 343, Sept. 1, 1885, and No. 8503, July 24, 1929. Oxford, No. 4736, Oct. 11, 1917. Orion, No. 6833, Sept. 26, 1923.

Vaccinium Pensilvanicum Lam., var *nigrum* Wood. The fruit is black and the leaves are darker green and firmer. With the specific type, but much less frequent. Sand dunes at Five Mile Point, No. 8531, July 31, 1929.

Asclepias Syriaca Linn. Common Milkweed. Silkweed. This species has broadly oval or ovate leaves, and echinate, falcately-beaked, tomentose, acute capsules, 3 to 5 inches long. Common in fields, etc., everywhere. Livonia, No. 8598, Sept. 17.

Var. *Illinoensis* Pers. (forma *inermis* Churchill). In this variety the leaves are very long and narrow, (elongated-oblong or lanceolate) and the capsules are shorter (2 to 3 inches), straighter, beakless, obtuse, and unarmed. Intermediate forms occur. Probably as widely distributed as the species but much less frequent. Well distributed in southeastern Michigan. Livonia, No. 8599, Sept. 17.

Phlox divaricata Linn, f. *albiflora* Farw. Livonia, No. 8320, May 7.

Forma *purpurea* Farw. Livonia, No. 8316, May 7.

Physalis Virginiana Mill. Ground Cherry. Scarce at Livonia. Villose. No. 8516, Sept. 17.

Var. *vulgaris* Rydb. With the species, but much more frequent. Pubescence scarce, short, and reflexed. No. 8595, Sept. 17. Also in the vicinity of River Rouge, Gladewitz, Sept. 23, 1929.

P. subglabrata Mack. & Bush. In the vicinity of River Rouge Park, Gladewitz, Sept. 23, 1929.

Pentstemon pallidus Small. Found in Livonia township by Mr. B. Gladewitz on June 2, 1929. We found it again in the same township in a field about a mile west of the first place, and in a different section, on June 11. Nos. 8415 and 8421. No. 8475, July 9. Whether or not this is the same as

the plant I collected on Belle Isle, No. 1717, June 14, 1901, as *P. canescens* Britton, I cannot say, as I haven't it for comparison.

Ilysanthes dubia (Linn.) Robinson non Barnhart. *I. attenuata* Small. In moist places. S. w. St. Clair Co., No. 8555, Aug. 27.

Veronica Anagallis-aquatica Linn, var. *glandulosa* Farw. In ditches near Ann Arbor, No. 8438, June 25, 1929.

Melampyrum lineare Lam. *M. Americanum* Mx. The foliage leaves are linear-lanceolate, entire; the floral leaves differ only in having teeth on the sides near the base. The corolla in bud is pale yellow or cream; in flower the tube is white, the limb purple. Occasionally one or more floral leaves may have only one tooth on one side or may even be entire like the foliage leaf. In sandy or rocky woods. Keweenaw Co., No. 319, Aug. 12, 1885 and No. 8498, July 24, 1929. Detroit, No. 319 1-2, Aug. 20, 1892, and No. 319a, Sept. 3, 1894.

Var. *latifolium* (Eaton & Wright) n. comb. *M. Americanum* var. *latifolium* Eaton & Wright not *M. latifolium* Muhl. In this variety the floral leaves are much broader and shorter than the foliage leaves. Distinguished from *M. latifolium* Muhl. by having the floral leaves toothed in the basal region. Keweenaw Co., No. 839, Aug. 1894. Detroit, No. 839a, Sept. 3, 1894. Royal Oak, No. 5593, Aug. 12, 1920.

Plantago altissima Linn. Peduncles deeply 5 sulcate and consequently prominently and acutely 5 wing-angled. Generally the peduncles are much longer and coarser (erect or prostrate, 2 feet long, more or less) than those of *P. lanceolata*, which are terete and about 10-striate. Livonia, No. 8474, July 9.

Solidago Purshii Porter. Shore Goldenrod. Abundant on rocky shores. Copper Harbor: No. 8499, July 24, 1929; No. 501, July 28, 1887; No. 501a, July 1, 1897. No. 501d, Aug. 20, 1898; No. 501e, Aug. 16, 1921. Eagle Harbor, No. 6601, June 29, 1923.

Var. *nana* (A. Gr.) n. comb. *S. humilis* var. *nana* A. Gr. *S. decumbens* Greene. Rocky shores but rather scarce compared with the typical species. Copper Harbor: No. 8500,

July 24, 1929; No. 501b, July 1, 1897; No. 501c, Aug. 20, 1898. Eagle Harbor, No. 6612b, June 29, 1923.

Var. *Gillmani* (A. Gr.) Farwell. *S. humilis* var. *Gillmani* A. Gr. These three extremes appear to be distinct enough, but there are many intermediate forms intergrading one into another, and sometimes it is a puzzling question to determine into which category a plant should be placed. Rocky shores at Eagle Harbor, No. 6612c, June 29, 1923.

S. Ulmifolia Muhl. Borders of woods and thickets. Just coming into flower. This species is widely distributed in southeast Michigan and quite abundant. S. w. St. Clair Co., No. 8565, Aug. 27.

Madia glomerata Hook. Tarweed. One of the Compositae from the Rocky Mountains and westward. Collected in River Rouge Park, Detroit, Sept. 1, 1929, by L. Bach and B. Glade-witz. A glandular glutinous plant with narrow linear-lanceolate leaves and heads sessile in a terminal glomerule and in the upper axils; more or less hirsute and leaves ciliate.

Achillea Millefolium Linn, var. *rubra* Sadl. (Vars. *crustata* Rochel; *scabra* (Host) Rochel; *Asplenifolia* (Vent.) Farw.; and *rosea* (Desf.) T. & Gr.; var. *lanulosa* f. *rubicunda* Farw.; *A. lanulosa* f. *rubicunda* Farw.; *A. Asplenifolia* Vent.; *A. rosea* Desf.) This variety is generally said to be an escape from cultivation. It is supposed to be a native of North America, which probably is a fact. I have found it in fields and on borders of woods in regions where it is not known to be in cultivation. Have also seen it in cultivation, from which place it spreads into surrounding grounds, apparently not by seed but by rhizomes. I should say that plants found away from the vicinity of gardens are not escapes from cultivation, but are native wild plants. The suborbicular rays (1 to 1.5 lines in diameter) vary from pale rose to purple. Fields at Livonia, No. 8456, July 2.

Subvar. *parviligulata* n. subv. Rays white, generally smaller (.5 to 1 line in diameter). In so far as I am aware, this white rayed form is not in cultivation, and I would not

call it anything but a native plant. Dr. Rydberg identified it as a white rayed *A. Asplenifolia*. I would place here also the plant from Alabama which, in a previous report (see this Journal, Vol. XI, p. 268, and 269) I thought might be var. *maritima* Jepson, which, judging from the description is the same thing. It has rays 1 line in diameter, while the Michigan plants have rays much smaller. The plants from the far north have a perceptible pale brown border to the involucreal scales, which is not evident in those plants from farther south. Rochester: No. 8578, Sept. 10; No. 6970, July 16, 1924. Calumet and Lake Linden, No. 6597, June 25, 1923. Royal Oak, No. 5587 1-2, Oct. 12, 1920.

Matricaria suaveolens (Ph.) Buchn. Pine Apple Weed. Spreading. Calumet, Laurium, Red Jacket and Houghton, all in Houghton Co., No. 8532 1-2, August 4, 1929.

Senecio aureus Linn, var. *Aurantiacus* n. var. Ligules shorter (3-4 lines long), orange red, reflexed; traces of floccose tomentum present throughout the plant at the flowering time; stems red; root leaves smaller (3 inches long or less), sub-orbicular or broadly ovate. Easily distinguished in the field by its flame colored, reflexed, smaller ligules, those of *S. aureus* being pale yellow, spreading and larger (5 lines long), and by its red stems and smaller, more rugose radical leaves. Open fields in moist, usually calcareous places; Plymouth, No. 8378, May 30. Also at Parkedale: No. 2552, May 19, 1912; No. 2651a, June 9, 1912; No. 3408, May 25, 1913.

Cirsium arvense (L.) Scop., var. *integrifolium* Wimm. & Grab. The Canada Thistle with flat, undivided leaves. Roadsides at Livonia, where plentiful. No. 8476, July 9.

Centaurea Jacea Linn. Star Thistle. In a field near Rochester. This and the next two species are well established here and have been for a goodly numbr of years. All have enlarged marginal flowers. No. 8589, Sept. 10.

C. maculosa Lam. No. 8590, Sept. 10.

C. Vochinensis Bernh. No. 8591, Sept. 10. In so far as we are aware, this species and *C. Jacea* have not before been

reporter for Michigan. Mr. Gladewitz found these species here in 1919. This field probably had been cultivated at one time, but now it is over-run with native herbs and shrubs. That part of the field where most of these species were located has again been brought under cultivation, and many of the plants have disappeared. They are not as numerous as they were 10 years ago.

Tragopogon major Jacq. The young parts of the plants are rather floccose; not over 6 or 8 inches in height when first beginning to flower. Plymouth, No. 8379, May 30; No. 8455, July 2.

Adopogon Necker (1790). Kuntze has shown that this name should supersede *Krigia* Schreb. (1791). The type species is *Tragopogon Virginicum* Linn.

A. Virginicum (L.) O. K. *Hyoseris Prenanthoides* Willd. The leaves are mainly radical, and these are lyrate with rotund lobes, obtuse but apiculate, and taper into a short petiole which is either naked or more or less margined. The stem leaf, usually one, rarely two or three, is amplexicaul and acute in all the varieties of this species; in the specific type it is oblong-lanceolate. Fig. 1. Ypsilanti, No. 1123, May 29, 1891. Detroit, No. 1123a, June 10, 1893. Keweenaw Co., No. 1123b, May, 1908. Rochester, No. 2662, June 11, 1912, and No. 3982, June 20, 1915. Algonac, No. 3971, June 16, 1915. Oxford, No. 6518b, June 6, 1923. Detroit, Dr. Geo. Suttie, June 5, 1891.

Var. *acuminatum* n. var. The radical leaves and their lobes are acute. The stem leaf is narrowly ovate-lanceolate. Probably *Cynthia Griffithii* Nutt. Fig. 2. Livonia, No. 8400, June 11. Also at Ecorse, No. 6910, June 11, 1924.

Var. *integrifolium* n. var. Radical leaves numerous, short, (3 inches or less), obovate, oval or oblong, entire or subentire, rounded at apex. Stem leaf broadly ovate-lanceolate. *Hyoseris amplexicaulis* Mx. *Krigia integrifolia* Raf., probably, which is not the basis of this varietal name, however. Fig. 3. Detroit, No. 970a, June 7, 1895 and No. 2032 1-2, June 30, 1907. Oxford, No. 6929, June 25, 1924.

Var. *elongatum* n. var. Radical leaves elongated (4-7

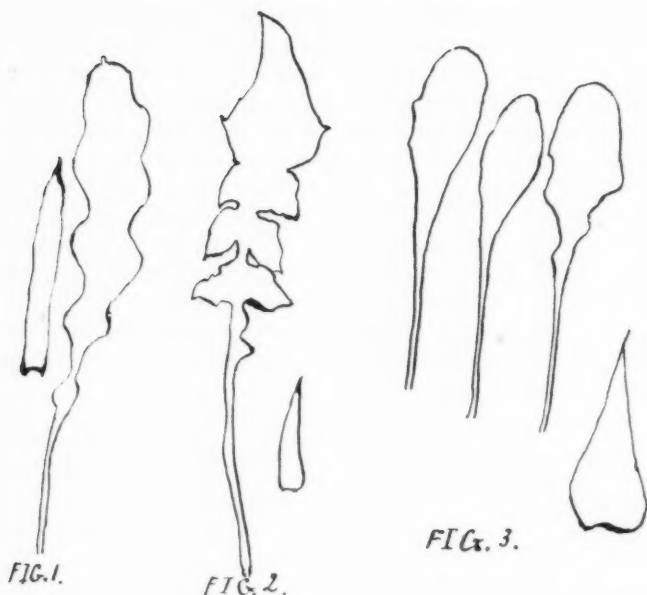


Fig. 1.—*Adopogon Virginicum* (L.) O. K.

Fig. 2.—Var. *Acuminatum*, N. Var.

Fig. 3.—Var. *Integrifolium*, N. Var.

inches long), oblanceolate, oblong-obovate, obtuse or rarely apiculate, entire, subentire, or rarely sinuately denticulate. Stem leaf broadly ovate-lanceolate. Fig. 4. Detroit, No. 970b, June 7, 1895. Algonac, No. 3971 1-2, June 1915.*

*[In the Herbarium of Parke, Davis & Co. there is a sheet of var. *integrifolium* from Franklin, N. J., Dr. H. H. Rusby, May, 1879. Probably this is the most widely distributed variation of the species.

Var. *glandulosum* n. var. peduncles glandular hispid below the head. Probably *Cynthia viridis* Standley. Pine River, Colorado, No. 2333, Aug. 13, 1911.

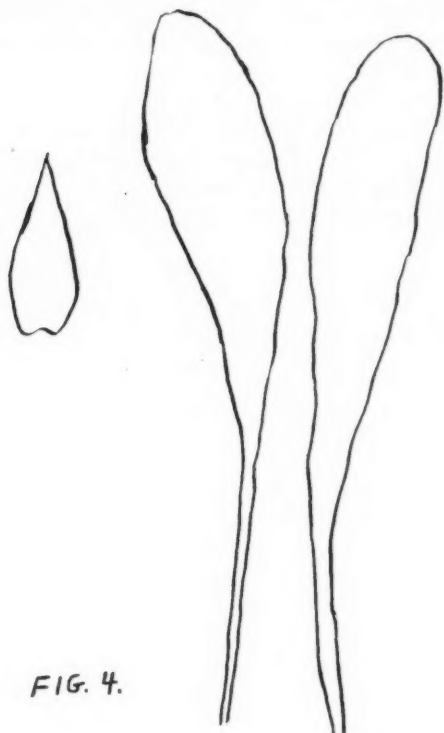


FIG. 4.

Fig. 4.—*Adopogon Virginicum* Var. *Elongatum*, N. Var.

Var. *hispida* n. var. More robust and larger throughout, peduncles hispid below the head. Tenn. to N. C. and Ga. Perhaps *Hyoseris biflora* Walt.]

Hieracium piloselloides Vill. *H. Florentinum* All. King Devil. Leaves pilose, the hairs with swollen black bases. Rapidly spreading all over the Copper District. Lake Linden, No. 8511, July 29, 1929.

Var. *epilosum* n. var. Leaves glabrous. With the type form, but less frequent. Lake Linden, No. 8512, July 29, 1929.

In November a very pleasant visit was paid Dr. Nieuwland at Notre Dame. The privilege of consulting the library and herbarium yielded profitable results. Sincere thanks are tendered Dr. Nieuwland for the courtesy shown.

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BOOK REVIEWS

OUTLINES OF GENERAL ZOOLOGY (Revised Edition).

H. H. Newman. MacMillan. \$3.50. Review by N. M. GRIER, Evansville College, Evansville, Indiana.

This well known text, it will be remembered, embodies in its presentation a compromise between the older type method and the newer principles method in the teaching of general Zoology. This is quite consistent with the statement of the author with which few will disagree, that Zoology is the most intricate of all the sciences, and therefore the broader the basis of approach, the better.

If Professor Newman's treatment of the subject is in the main dynamic, the older aspects of the science in disrepute with many zoologists has not been neglected. Thus he also includes an account of the diphyletic tree theory of animal evolution. Most unique in a college textbook and highly suggestive to many teachers is his list of sixty of the outstanding principles and problems of Zoology. Too often does a student leave a course with a feeling that he has actually "completed" it and that the last word has been said. Quite frequently also has the teacher, removed from an intellectually stimulating atmosphere, routinized his work to the absolute exclusion of the imaginative and the knowledge seeking attitude. Those who are familiar with the style of Professor Newman's textbooks, whether teacher or pupil, may expect more of the same invigorating stimuli from the perusal of this edition.

EDUCATIONAL BIOLOGY, By John C. Johnson, Ph.D.—The Macmillan Co.

The author believes that "certain well-established biological facts, principles and laws may serve as a background for the understanding of the child and as basis for the solution of many teaching problems." It is his purpose to "collect, select, interpret, and organize these facts and laws in book form." It would seem that the purpose of the author has been realized. Not every statement in the twenty-seven chapters will go unchallenged, but, on the whole, the treatment of the various subjects is constructive and conservative. However, it is not a book for him who knows little or nothing of biology. It seems to us that more information is taken for granted than will form the store of knowledge of those for whom the book is intended. This reviewer would prefer a fundamental course in botany and one in zoology for all aspirants to the teaching profession. A real teacher will know what applications to make for his class.—F. W.

A COLLEGE TEXTBOOK OF HYGIENE, By Dean Franklin Smiley and Adrian Gordon Gould.—The Macmillan Co.

The care of bodily health should be the concern of everyone. Instruction in this important subject should be started early in life and should be adapted to the understanding of the pupil. The book in question is meant for college students. In eleven sections, the authors cover the ground rather thoroughly. The principles of the science of hygiene are clearly outlined and clearly presented. We know of no book which covers the entire subject in so thorough and readable a manner. For this reason, if for no other, we regret the author's remarks concerning the use of contraception. If "for health or economic reasons the production of children must be limited" (p. 282), neither "the family physician" or any other person may counsel "the use of contraception." We know no principle in morals that justifies such a practice.—F. W.

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